SEQUENCE LISTING

<110> JENTSCH, Thomas

<120> NOVEL POTASSIUM CHANNELS AND GENES ENCODING THESE POTASSIUM CHANNELS

<130> 2815-0236P

<140> NEW
<141> 2003-09-11

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<170> PatentIn version 3.0

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Met Lys Asp Val Glu Ser Gly Arg Gly Arg Val Leu Leu Asn Ser Ala
  1               5                  10                  15

gcc gcc agg ggc gac ggc ctg cta ctg ctg ggc acc cgc gcg gcc acg   96
Ala Ala Arg Gly Asp Gly Leu Leu Leu Leu Gly Thr Arg Ala Ala Thr
             20                  25                  30

ctc ggt ggc ggc ggc ggt ggc ctg agg gag agc cgc cgg ggc aag cag   144
Leu Gly Gly Gly Gly Gly Gly Leu Arg Glu Ser Arg Arg Gly Lys Gln
         35                  40                  45

ggg gcc cgg atg agc ctg ctg ggg aag ccg ctc tct tac acg agt agc   192
Gly Ala Arg Met Ser Leu Leu Gly Lys Pro Leu Ser Tyr Thr Ser Ser
     50                  55                  60

cag agc tgc cgg cgc aac gtc aag tac cgg cgg gtg cag aac tac ctg   240
Gln Ser Cys Arg Arg Asn Val Lys Tyr Arg Arg Val Gln Asn Tyr Leu
 65                  70                  75                  80

tac aac gtg ctg gag aga ccc cgc ggc tgg gcg ttc atc tac cac gct   288
Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His Ala
                 85                  90                  95

ttc gtt ttt ctc ctt gtc ttt ggt tgc ttg att ttg tca gtg ttt tct   336
Phe Val Phe Leu Leu Val Phe Gly Cys Leu Ile Leu Ser Val Phe Ser
            100                 105                 110

acc atc cct gag cac aca aaa ttg gcc tca agt tgc ctc ttg atc ctg   384
Thr Ile Pro Glu His Thr Lys Leu Ala Ser Ser Cys Leu Leu Ile Leu
        115                 120                 125
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gag ttc gtg atg att gtc gtc ttt ggt ttg gag ttc atc att cga atc   432
Glu Phe Val Met Ile Val Val Phe Gly Leu Glu Phe Ile Ile Arg Ile
    130                 135                 140

tgg tct gcg ggt tgc tgt tgt cga tat aga gga tgg caa gga aga ctg   480
Trp Ser Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Gln Gly Arg Leu
145                 150                 155                 160

agg ttt gct cga aag ccc ttc tgt gtt ata gat acc att gtt ctt atc   528
Arg Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Thr Ile Val Leu Ile
                165                 170                 175

gct tca ata gca gtt gtt tct gca aaa act cag ggt aat att ttt gcc   576
Ala Ser Ile Ala Val Val Ser Ala Lys Thr Gln Gly Asn Ile Phe Ala
            180                 185                 190

acg tct gca ctc aga agt ctc cgt ttc cta cag atc ctc cgc atg gtg   624
Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Val
        195                 200                 205

cgc atg gac cga agg gga ggc act tgg aaa tta ctg ggt tca gtg gtt   672
Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val Val
    210                 215                 220

tat gct cac agc aag gaa tta atc aca gct tgg tac ata gga ttt ttg   720
Tyr Ala His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu
225                 230                 235                 240

gtt ctt att ttt tcg tct ttc ctt gtc tat ctg gtg gaa aag gat gcc   768
Val Leu Ile Phe Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Ala
                245                 250                 255

aat aaa gag ttt tct aca tat gca gat gct ctc tgg tgg ggc aca att   816
Asn Lys Glu Phe Ser Thr Tyr Ala Asp Ala Leu Trp Trp Gly Thr Ile
            260                 265                 270

aca ttg aca act att ggc tat gga gac aaa act ccc cta act tgg ctg   864
Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Thr Pro Leu Thr Trp Leu
        275                 280                 285

gga aga ttg ctt tct gca ggc ttt gca ctc ctt ggc att tct ttc ttt   912
Gly Arg Leu Leu Ser Ala Gly Phe Ala Leu Leu Gly Ile Ser Phe Phe
    290                 295                 300

gca ctt cct gcc ggc att ctt ggc tca ggt ttt gca tta aaa gta caa   960
Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val Gln
305                 310                 315                 320

gaa caa cac cgc cag aaa cac ttt gag aaa aga agg aac cca gct gcc   1008
Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala Ala
                325                 330                 335

aac ctc att cag tgt gtt tgg cgt agt tac gca gct gat gag aaa tct   1056
Asn Leu Ile Gln Cys Val Trp Arg Ser Tyr Ala Ala Asp Glu Lys Ser
            340                 345                 350

gtt tcc att gca acc tgg aag cca cac ttg aag gcc ttg cac acc tgc   1104
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Val Ser Ile Ala Thr Trp Lys Pro His Leu Lys Ala Leu His Thr Cys
        355                 360                 365

agc cct acc aag aaa gaa caa ggg gaa gca tca agc agt cag aag cta   1152
Ser Pro Thr Lys Lys Glu Gln Gly Glu Ala Ser Ser Ser Gln Lys Leu
    370                 375                 380

agt ttt aag gag cga gtg cgc atg gct agc ccc agg ggc cag agt att   1200
Ser Phe Lys Glu Arg Val Arg Met Ala Ser Pro Arg Gly Gln Ser Ile
385                 390                 395                 400

aag agc cga caa gcc tca gta ggt gac agg agg tcc cca agc acc gac   1248
Lys Ser Arg Gln Ala Ser Val Gly Asp Arg Arg Ser Pro Ser Thr Asp
                405                 410                 415

atc aca gcc gag ggc agt ccc acc aaa gtg cag aag agc tgg agc ttc   1296
Ile Thr Ala Glu Gly Ser Pro Thr Lys Val Gln Lys Ser Trp Ser Phe
            420                 425                 430

aac gac cga acc cgc ttc cgg ccc tcg ctg cgc ctc aaa agt tct cag   1344
Asn Asp Arg Thr Arg Phe Arg Pro Ser Leu Arg Leu Lys Ser Ser Gln
        435                 440                 445

cca aaa cca gtg ata gat gct gac aca gcc ctt ggc act gat gat gta   1392
Pro Lys Pro Val Ile Asp Ala Asp Thr Ala Leu Gly Thr Asp Asp Val
    450                 455                 460

tat gat gaa aaa gga tgc cag tgt gat gta tca gtg gaa gac ctc acc   1440
Tyr Asp Glu Lys Gly Cys Gln Cys Asp Val Ser Val Glu Asp Leu Thr
465                 470                 475                 480

cca cca ctt aaa act gtc att cga gct atc aga att atg aaa ttt cat   1488
Pro Pro Leu Lys Thr Val Ile Arg Ala Ile Arg Ile Met Lys Phe His
                485                 490                 495

gtt gca aaa cgg aag ttt aag gaa aca tta cgt cca tat gat gta aaa   1536
Val Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys
            500                 505                 510

gat gtc att gaa caa tat tct gct ggt cat ctg gac atg ttg tgt aga   1584
Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Cys Arg
        515                 520                 525

att aaa agc ctt caa aca cgt gtt gat caa att ctt gga aaa ggg caa   1632
Ile Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Leu Gly Lys Gly Gln
    530                 535                 540

atc aca tca gat aag aag agc cga gag aaa ata aca gca gaa cat gag   1680
Ile Thr Ser Asp Lys Lys Ser Arg Glu Lys Ile Thr Ala Glu His Glu
545                 550                 555                 560

acc aca gac gat ctc agt atg ctc ggt cgg gtg gtc aag gtt gaa aaa   1728
Thr Thr Asp Asp Leu Ser Met Leu Gly Arg Val Val Lys Val Glu Lys
                565                 570                 575

cag gta cag tcc ata gaa tcc aag ctg gac tgc cta cta gac atc tat   1776
Gln Val Gln Ser Ile Glu Ser Lys Leu Asp Cys Leu Leu Asp Ile Tyr
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                580                 585                 590

caa cag gtc ctt cgg aaa ggc tct gcc tca gcc ctc gct ttg gct tca   1824
Gln Gln Val Leu Arg Lys Gly Ser Ala Ser Ala Leu Ala Leu Ala Ser
        595                 600                 605

ttc cag atc cca cct ttt gaa tgt gaa cag aca tct gac tat caa agc   1872
Phe Gln Ile Pro Pro Phe Glu Cys Glu Gln Thr Ser Asp Tyr Gln Ser
    610                 615                 620

cct gtg gat agc aaa gat ctt tcg ggt tcc gca caa aac agt ggc tgc   1920
Pro Val Asp Ser Lys Asp Leu Ser Gly Ser Ala Gln Asn Ser Gly Cys
625                 630                 635                 640

tta tcc aga tca act agt gcc aac atc tcg aga ggc ctg cag ttc att   1968
Leu Ser Arg Ser Thr Ser Ala Asn Ile Ser Arg Gly Leu Gln Phe Ile
                645                 650                 655

ctg acg cca aat gag ttc agt gcc cag act ttc tac gcg ctt agc cct   2016
Leu Thr Pro Asn Glu Phe Ser Ala Gln Thr Phe Tyr Ala Leu Ser Pro
            660                 665                 670

act atg cac agt caa gca aca cag gtg cca att agt caa agc gat ggc   2064
Thr Met His Ser Gln Ala Thr Gln Val Pro Ile Ser Gln Ser Asp Gly
        675                 680                 685

tca gca gtg gca gcc acc aac acc att gca aac caa ata aat acg gca   2112
Ser Ala Val Ala Ala Thr Asn Thr Ile Ala Asn Gln Ile Asn Thr Ala
    690                 695                 700

ccc aag cca gca gcc cca aca act tta cag atc cca cct cct ctc cca   2160
Pro Lys Pro Ala Ala Pro Thr Thr Leu Gln Ile Pro Pro Pro Leu Pro
705                 710                 715                 720

gcc atc aag cat ctg ccc agg cca gaa act ctg cac cct aac cct gca   2208
Ala Ile Lys His Leu Pro Arg Pro Glu Thr Leu His Pro Asn Pro Ala
                725                 730                 735

ggc tta cag gaa agc att tct gac gtc acc acc tgc ctt gtt gcc tcc   2256
Gly Leu Gln Glu Ser Ile Ser Asp Val Thr Thr Cys Leu Val Ala Ser
            740                 745                 750

aag gaa aat gtt cag gtt gca cag tca aat ctc acc aag gac cgt tct   2304
Lys Glu Asn Val Gln Val Ala Gln Ser Asn Leu Thr Lys Asp Arg Ser
        755                 760                 765

atg agg aaa agc ttt gac atg gga gga gaa act ctg ttg tct gtc tgt   2352
Met Arg Lys Ser Phe Asp Met Gly Gly Glu Thr Leu Leu Ser Val Cys
    770                 775                 780

ccc atg gtg ccg aag gac ttg ggc aaa tct ttg tct gtg caa aac ctg   2400
Pro Met Val Pro Lys Asp Leu Gly Lys Ser Leu Ser Val Gln Asn Leu
785                 790                 795                 800

atc agg tcg acc gag gaa ctg aat ata caa ctt tca ggg agt gag tca   2448
Ile Arg Ser Thr Glu Glu Leu Asn Ile Gln Leu Ser Gly Ser Glu Ser
                805                 810                 815
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agt ggc tcc aga ggc agc caa gat ttt tac ccc aaa tgg agg gaa tcc   2496
Ser Gly Ser Arg Gly Ser Gln Asp Phe Tyr Pro Lys Trp Arg Glu Ser
            820                 825                 830

aaa ttg ttt ata act gat gaa gag gtg ggt ccc gaa gag aca gag aca   2544
Lys Leu Phe Ile Thr Asp Glu Glu Val Gly Pro Glu Glu Thr Glu Thr
        835                 840                 845

gac act ttt gat gcc gca ccg cag cct gcc agg gaa gct gcc ttt gca   2592
Asp Thr Phe Asp Ala Ala Pro Gln Pro Ala Arg Glu Ala Ala Phe Ala
    850                 855                 860

tca gac tct cta agg act gga agg tca cga tca tct cag agc att tgt   2640
Ser Asp Ser Leu Arg Thr Gly Arg Ser Arg Ser Ser Gln Ser Ile Cys
865                 870                 875                 880

aag gca gga gaa agt aca gat gcc ctc agc ttg cct cat gtc aaa ctg   2688
Lys Ala Gly Glu Ser Thr Asp Ala Leu Ser Leu Pro His Val Lys Leu
                885                 890                 895

aaa taagttcttc attttctttc caggcatagc agttctttag ccatacatat        2741
Lys

cattgcatga actatttcga aagcccttct aaaaagttga aattgcaaga atcgggaaga 2801

acatgaaagg cagtttataa gcccgttacc ttttaattgc atgaaaatgc atgtttaggg 2861

atggctaaaa ttccaaggtg catcgacatt aacccactca tttagtaatg taccttgagt 2921

taaaaagcct gagaaaccaa acacagctaa tgctatgggg tgtatgaata tgtcaagttt 2981

aggtcattta gaagatttga cactgtattt tgaaattatg ggagtaaaca ccttcaaatt 3041

tcaggcattt ctgctttgtg actaaataca aactacattt tcaagattag gccataatgt 3101

atatttaaac acaatggcta tcaacagctg ctaata                           3137


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<213>  Homo sapiens

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Met Lys Asp Val Glu Ser Gly Arg Gly Arg Val Leu Leu Asn Ser Ala
  1               5                  10                  15

Ala Ala Arg Gly Asp Gly Leu Leu Leu Leu Gly Thr Arg Ala Ala Thr
             20                  25                  30

Leu Gly Gly Gly Gly Gly Gly Leu Arg Glu Ser Arg Arg Gly Lys Gln
         35                  40                  45

Gly Ala Arg Met Ser Leu Leu Gly Lys Pro Leu Ser Tyr Thr Ser Ser
     50                  55                  60
```

```
Gln Ser Cys Arg Arg Asn Val Lys Tyr Arg Arg Val Gln Asn Tyr Leu
 65                  70                  75                  80

Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His Ala
                85                  90                  95

Phe Val Phe Leu Leu Val Phe Gly Cys Leu Ile Leu Ser Val Phe Ser
            100                 105                 110

Thr Ile Pro Glu His Thr Lys Leu Ala Ser Ser Cys Leu Leu Ile Leu
        115                 120                 125

Glu Phe Val Met Ile Val Val Phe Gly Leu Glu Phe Ile Ile Arg Ile
    130                 135                 140

Trp Ser Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Gln Gly Arg Leu
145                 150                 155                 160

Arg Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Thr Ile Val Leu Ile
                165                 170                 175

Ala Ser Ile Ala Val Val Ser Ala Lys Thr Gln Gly Asn Ile Phe Ala
            180                 185                 190

Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Val
        195                 200                 205

Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val Val
    210                 215                 220

Tyr Ala His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu
225                 230                 235                 240

Val Leu Ile Phe Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Ala
                245                 250                 255

Asn Lys Glu Phe Ser Thr Tyr Ala Asp Ala Leu Trp Trp Gly Thr Ile
            260                 265                 270

Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Thr Pro Leu Thr Trp Leu
        275                 280                 285

Gly Arg Leu Leu Ser Ala Gly Phe Ala Leu Leu Gly Ile Ser Phe Phe
    290                 295                 300

Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val Gln
305                 310                 315                 320

Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala Ala
                325                 330                 335

Asn Leu Ile Gln Cys Val Trp Arg Ser Tyr Ala Ala Asp Glu Lys Ser
            340                 345                 350

Val Ser Ile Ala Thr Trp Lys Pro His Leu Lys Ala Leu His Thr Cys
        355                 360                 365
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```
Ser Pro Thr Lys Lys Glu Gln Gly Glu Ala Ser Ser Ser Gln Lys Leu
    370                 375                 380

Ser Phe Lys Glu Arg Val Arg Met Ala Ser Pro Arg Gly Gln Ser Ile
385                 390                 395                 400

Lys Ser Arg Gln Ala Ser Val Gly Asp Arg Arg Ser Pro Ser Thr Asp
                405                 410                 415

Ile Thr Ala Glu Gly Ser Pro Thr Lys Val Gln Lys Ser Trp Ser Phe
            420                 425                 430

Asn Asp Arg Thr Arg Phe Arg Pro Ser Leu Arg Leu Lys Ser Ser Gln
        435                 440                 445

Pro Lys Pro Val Ile Asp Ala Asp Thr Ala Leu Gly Thr Asp Asp Val
    450                 455                 460

Tyr Asp Glu Lys Gly Cys Gln Cys Asp Val Ser Val Glu Asp Leu Thr
465                 470                 475                 480

Pro Pro Leu Lys Thr Val Ile Arg Ala Ile Arg Ile Met Lys Phe His
                485                 490                 495

Val Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys
            500                 505                 510

Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Cys Arg
        515                 520                 525

Ile Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Leu Gly Lys Gly Gln
    530                 535                 540

Ile Thr Ser Asp Lys Lys Ser Arg Glu Lys Ile Thr Ala Glu His Glu
545                 550                 555                 560

Thr Thr Asp Asp Leu Ser Met Leu Gly Arg Val Val Lys Val Glu Lys
                565                 570                 575

Gln Val Gln Ser Ile Glu Ser Lys Leu Asp Cys Leu Leu Asp Ile Tyr
            580                 585                 590

Gln Gln Val Leu Arg Lys Gly Ser Ala Ser Ala Leu Ala Leu Ala Ser
        595                 600                 605

Phe Gln Ile Pro Pro Phe Glu Cys Glu Gln Thr Ser Asp Tyr Gln Ser
    610                 615                 620

Pro Val Asp Ser Lys Asp Leu Ser Gly Ser Ala Gln Asn Ser Gly Cys
625                 630                 635                 640

Leu Ser Arg Ser Thr Ser Ala Asn Ile Ser Arg Gly Leu Gln Phe Ile
                645                 650                 655

Leu Thr Pro Asn Glu Phe Ser Ala Gln Thr Phe Tyr Ala Leu Ser Pro
            660                 665                 670
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Thr Met His Ser Gln Ala Thr Gln Val Pro Ile Ser Gln Ser Asp Gly
        675                 680                 685

Ser Ala Val Ala Ala Thr Asn Thr Ile Ala Asn Gln Ile Asn Thr Ala
    690                 695                 700

Pro Lys Pro Ala Ala Pro Thr Thr Leu Gln Ile Pro Pro Pro Leu Pro
705                 710                 715                 720

Ala Ile Lys His Leu Pro Arg Pro Glu Thr Leu His Pro Asn Pro Ala
                725                 730                 735

Gly Leu Gln Glu Ser Ile Ser Asp Val Thr Thr Cys Leu Val Ala Ser
            740                 745                 750

Lys Glu Asn Val Gln Val Ala Gln Ser Asn Leu Thr Lys Asp Arg Ser
        755                 760                 765

Met Arg Lys Ser Phe Asp Met Gly Gly Glu Thr Leu Leu Ser Val Cys
    770                 775                 780

Pro Met Val Pro Lys Asp Leu Gly Lys Ser Leu Ser Val Gln Asn Leu
785                 790                 795                 800

Ile Arg Ser Thr Glu Glu Leu Asn Ile Gln Leu Ser Gly Ser Glu Ser
                805                 810                 815

Ser Gly Ser Arg Gly Ser Gln Asp Phe Tyr Pro Lys Trp Arg Glu Ser
            820                 825                 830

Lys Leu Phe Ile Thr Asp Glu Glu Val Gly Pro Glu Glu Thr Glu Thr
        835                 840                 845

Asp Thr Phe Asp Ala Ala Pro Gln Pro Ala Arg Glu Ala Ala Phe Ala
    850                 855                 860

Ser Asp Ser Leu Arg Thr Gly Arg Ser Arg Ser Ser Gln Ser Ile Cys
865                 870                 875                 880

Lys Ala Gly Glu Ser Thr Asp Ala Leu Ser Leu Pro His Val Lys Leu
                885                 890                 895

Lys
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<210> 3
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<212> PRT
<213> Homo sapiens

<400> 3

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Trp Gly Arg Leu Pro Gly Ala Arg Arg Gly Ser Ala Gly Leu Ala Lys
            20                  25                  30
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```
Lys Cys Pro Phe Ser Leu Glu Leu Ala Glu Gly Gly Pro Ala Gly Gly
        35                  40                  45

Ala Leu Tyr Ala Pro Ile Ala Pro Gly Ala Pro Gly Pro Ala Pro Pro
    50                  55                  60

Ala Ser Pro Ala Ala Pro Ala Ala Pro Pro Val Ala Ser Asp Leu Gly
65                  70                  75                  80

Pro Arg Pro Pro Val Ser Leu Asp Pro Arg Val Ser Ile Tyr Ser Thr
                85                  90                  95

Arg Arg Pro Val Leu Ala Arg Thr His Val Gln Gly Arg Val Tyr Asn
            100                 105                 110

Phe Leu Glu Arg Pro Thr Gly Trp Lys Cys Phe Val Tyr His Phe Ala
        115                 120                 125

Val Phe Leu Ile Val Leu Val Cys Leu Ile Phe Ser Val Leu Ser Thr
    130                 135                 140

Ile Glu Gln Tyr Ala Ala Leu Ala Thr Gly Thr Leu Phe Trp Met Glu
145                 150                 155                 160

Ile Val Leu Val Val Phe Phe Gly Thr Glu Tyr Val Val Arg Leu Trp
                165                 170                 175

Ser Ala Gly Cys Arg Ser Lys Tyr Val Gly Leu Trp Gly Arg Leu Arg
            180                 185                 190

Phe Ala Arg Lys Pro Ile Ser Ile Ile Asp Leu Ile Val Val Val Ala
        195                 200                 205

Ser Met Val Val Leu Cys Val Gly Ser Lys Gly Gln Val Phe Ala Thr
    210                 215                 220

Ser Ala Ile Arg Gly Ile Arg Phe Leu Gln Ile Leu Arg Met Leu His
225                 230                 235                 240

Val Asp Arg Gln Gly Gly Thr Trp Arg Leu Leu Gly Ser Val Val Phe
                245                 250                 255

Ile His Arg Gln Glu Leu Ile Thr Thr Leu Tyr Ile Gly Phe Leu Gly
            260                 265                 270

Leu Ile Phe Ser Ser Tyr Phe Val Tyr Leu Ala Glu Lys Asp Ala Val
        275                 280                 285

Asn Glu Ser Gly Arg Val Glu Phe Gly Ser Tyr Ala Asp Ala Leu Trp
    290                 295                 300

Trp Gly Val Val Thr Val Thr Thr Ile Gly Tyr Gly Asp Lys Val Pro
305                 310                 315                 320

Gln Thr Trp Val Gly Lys Thr Ile Ala Ser Cys Phe Ser Val Phe Ala
                325                 330                 335
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Ile Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala
340 345 350

Leu Lys Val Gln Gln Lys Gln Arg Gln Lys His Phe Asn Arg Gln Ile
355 360 365

Pro Ala Ala Ala Ser Leu Ile Gln Thr Ala Trp Arg Cys Tyr Ala Ala
370 375 380

Glu Asn Pro Asp Ser Ser Thr Trp Lys Ile Tyr Ile Arg Lys Ala Pro
385 390 395 400

Arg Ser His Thr Leu Leu Ser Pro Ser Pro Lys Pro Lys Lys Ser Val
405 410 415

Val Val Lys Lys Lys Lys Phe Lys Leu Asp Lys Asp Asn Gly Val Thr
420 425 430

Pro Gly Glu Lys Met Leu Thr Val Pro His Ile Thr Cys Asp Pro Pro
435 440 445

Glu Glu Arg Arg Leu Asp His Phe Ser Val Asp Gly Tyr Asp Ser Ser
450 455 460

Val Arg Lys Ser Pro Thr Leu Leu Glu Val Ser Met Pro His Phe Met
465 470 475 480

Arg Thr Asn Ser Phe Ala Glu Asp Leu Asp Leu Glu Gly Glu Thr Leu
485 490 495

Leu Thr Pro Ile Thr His Ile Ser Gln Leu Arg Glu His His Arg Ala
500 505 510

Thr Ile Lys Val Ile Arg Arg Met Gln Tyr Phe Val Ala Lys Lys Lys
515 520 525

Phe Gln Gln Ala Arg Lys Pro Tyr Asp Val Arg Asp Val Ile Glu Gln
530 535 540

Tyr Ser Gln Gly His Leu Asn Leu Met Val Arg Ile Lys Glu Leu Gln
545 550 555 560

Arg Arg Leu Asp Gln Ser Ile Gly Lys Pro Ser Leu Phe Ile Ser Val
565 570 575

Ser Glu Lys Ser Lys Asp Arg Gly Ser Asn Thr Ile Gly Ala Arg Leu
580 585 590

Asn Arg Val Glu Asp Lys Val Thr Gln Leu Asp Gln Arg Leu Ala Leu
595 600 605

Ile Thr Asp Met Leu His Gln Leu Leu Ser Leu His Gly Gly Ser Thr
610 615 620

Pro Gly Ser Gly Gly Pro Pro Arg Glu Gly Gly Ala His Ile Thr Gln
625 630 635 640

Pro Cys Gly Ser Gly Gly Ser Val Asp Pro Glu Leu Phe Leu Pro Ser
645 650 655

Asn Thr Leu Pro Thr Tyr Glu Gln Leu Thr Val Pro Arg Arg Gly Pro
660 665 670

Asp Glu Gly Ser
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<213> Homo sapiens

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Glu Lys Lys Leu Lys Val Gly Phe Val Gly Leu Asp Pro Gly Ala Pro
20 25 30

Asp Ser Thr Arg Asp Gly Ala Leu Leu Ile Ala Gly Ser Glu Ala Pro
35 40 45

Lys Arg Gly Ser Ile Leu Ser Lys Pro Arg Ala Gly Gly Ala Gly Ala
50 55 60

Gly Lys Pro Pro Lys Arg Asn Ala Phe Tyr Arg Lys Leu Gln Asn Phe
65 70 75 80

Leu Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His
85 90 95

Ala Tyr Val Phe Leu Leu Val Phe Ser Cys Leu Val Leu Ser Val Phe
100 105 110

Ser Thr Ile Lys Glu Tyr Glu Lys Ser Ser Glu Gly Ala Leu Tyr Ile
115 120 125

Leu Glu Ile Val Thr Ile Val Val Phe Gly Val Glu Tyr Phe Val Arg
130 135 140

Ile Trp Ala Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Arg Gly Arg
145 150 155 160

Leu Lys Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Ile Met Val Leu
165 170 175

Ile Ala Ser Ile Ala Val Leu Ala Ala Gly Ser Gln Gly Asn Val Phe
180 185 190

Ala Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met
195 200 205

Ile Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val
210 215 220

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Val Tyr Ala His Ser Lys Glu Leu Val Thr Ala Trp Tyr Ile Gly Phe
225                 230                 235                 240

Leu Cys Leu Ile Leu Ala Ser Phe Leu Val Tyr Leu Ala Glu Lys Gly
                245                 250                 255

Glu Asn Asp His Phe Asp Thr Tyr Ala Asp Ala Leu Trp Trp Gly Leu
            260                 265                 270

Ile Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Tyr Pro Gln Thr Trp
        275                 280                 285

Asn Gly Arg Leu Leu Ala Ala Thr Phe Thr Leu Ile Gly Val Ser Phe
    290                 295                 300

Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val
305                 310                 315                 320

Gln Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala
                325                 330                 335

Ala Gly Leu Ile Gln Ser Ala Trp Arg Phe Tyr Ala Thr Asn Leu Ser
            340                 345                 350

Arg Thr Asp Leu His Ser Thr Trp Gln Tyr Tyr Glu Arg Thr Val Thr
        355                 360                 365

Val Pro Met Tyr Arg Leu Ile Pro Pro Leu Asn Gln Leu Glu Leu Leu
    370                 375                 380

Arg Asn Leu Lys Ser Lys Ser Gly Leu Ala Phe Arg Lys Asp Pro Pro
385                 390                 395                 400

Pro Glu Pro Ser Pro Ser Gln Lys Val Ser Leu Lys Asp Arg Val Phe
                405                 410                 415

Ser Ser Pro Arg Gly Val Ala Ala Lys Gly Lys Gly Ser Pro Gln Ala
            420                 425                 430

Gln Thr Val Arg Arg Ser Pro Ser Ala Asp Gln Ser Leu Glu Asp Ser
        435                 440                 445

Pro Ser Lys Val Pro Lys Ser Trp Ser Phe Gly Asp Arg Ser Arg Ala
    450                 455                 460

Arg Gln Ala Phe Arg Ile Lys Gly Ala Ala Ser Arg Gln Asn Ser Glu
465                 470                 475                 480

Glu Ala Ser Leu Pro Gly Glu Asp Ile Val Asp Asp Lys Ser Cys Pro
                485                 490                 495

Cys Glu Phe Val Thr Glu Asp Leu Thr Pro Gly Leu Lys Val Ser Ile
            500                 505                 510

Arg Ala Val Cys Val Met Arg Phe Leu Val Ser Lys Arg Lys Phe Lys
        515                 520                 525
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```
Glu Ser Leu Arg Pro Tyr Asp Val Met Asp Val Ile Glu Gln Tyr Ser
    530                 535                 540

Ala Gly His Leu Asp Met Leu Ser Arg Ile Lys Ser Leu Gln Ser Arg
545                 550                 555                 560

Val Asp Gln Ile Val Gly Arg Gly Pro Ala Ile Thr Asp Lys Asp Arg
                565                 570                 575

Thr Lys Gly Pro Ala Glu Ala Glu Leu Pro Glu Asp Pro Ser Met Met
            580                 585                 590

Gly Arg Leu Gly Lys Val Glu Lys Gln Val Leu Ser Met Glu Lys Lys
        595                 600                 605

Leu Asp Phe Leu Val Asn Ile Tyr Met Gln Arg Met Gly Ile Pro Pro
    610                 615                 620

Thr Glu Thr Glu Ala Tyr Phe Gly Ala Lys Glu Pro Glu Pro Ala Pro
625                 630                 635                 640

Pro Tyr His Ser Pro Glu Asp Ser Arg Glu His Val Asp Arg His Gly
                645                 650                 655

Cys Ile Val Lys Ile Val Arg Ser Ser Ser Ser Thr Gly Gln Lys Asn
            660                 665                 670

Phe Ser Ala Pro Pro Ala Ala Pro Pro Val Gln Cys Pro Pro Ser Thr
        675                 680                 685

Ser Trp Gln Pro Gln Ser His Pro Arg Gln Gly His Gly Thr Ser Pro
    690                 695                 700

Val Gly Asp His Gly Ser Leu Val Arg Ile Pro Pro Pro Pro Ala His
705                 710                 715                 720

Glu Arg Ser Leu Ser Ala Tyr Gly Gly Gly Asn Arg Ala Ser Met Glu
                725                 730                 735

Phe Leu Arg Gln Glu Asp Thr Pro Gly Cys Arg Pro Pro Glu Gly Thr
            740                 745                 750

Leu Arg Asp Ser Asp Thr Ser Ile Ser Ile Pro Ser Val Asp His Glu
        755                 760                 765

Glu Leu Glu Arg Ser Phe Ser Gly Phe Ser Ile Ser Gln Ser Lys Glu
    770                 775                 780

Asn Leu Asp Ala Leu Asn Ser Cys Tyr Ala Ala Val Ala Pro Cys Ala
785                 790                 795                 800

Lys Val Arg Pro Tyr Ile Ala Glu Gly Glu Ser Asp Thr Asp Ser Asp
                805                 810                 815

Leu Cys Thr Pro Cys Gly Pro Pro Pro Arg Ser Ala Thr Gly Glu Gly
            820                 825                 830
```

```
Pro Phe Gly Asp Val Gly Trp Ala Gly Pro Arg Lys
        835                 840

<210>  5
<211>  872
<212>  PRT
<213>  Homo sapiens

<400>  5
Met Gly Leu Lys Ala Arg Arg Ala Ala Gly Ala Ala Gly Gly Gly Gly
1               5                  10                  15

Asp Gly Gly Gly Gly Gly Gly Gly Ala Ala Asn Pro Ala Gly Gly Asp
            20                  25                  30

Ala Ala Ala Ala Gly Asp Glu Glu Arg Lys Val Gly Leu Ala Pro Gly
        35                  40                  45

Asp Val Glu Gln Val Thr Leu Ala Leu Gly Ala Gly Ala Asp Lys Asp
    50                  55                  60

Gly Thr Leu Leu Leu Glu Gly Gly Gly Arg Asp Glu Gly Gln Arg Arg
65                  70                  75                  80

Thr Pro Gln Gly Ile Gly Leu Leu Ala Lys Thr Pro Leu Ser Arg Pro
                85                  90                  95

Val Lys Arg Asn Asn Ala Lys Tyr Arg Arg Ile Gln Thr Leu Ile Tyr
            100                 105                 110

Asp Ala Leu Glu Arg Pro Arg Gly Trp Ala Leu Leu Tyr His Ala Leu
        115                 120                 125

Val Phe Leu Ile Val Leu Gly Cys Leu Ile Leu Ala Val Leu Thr Thr
    130                 135                 140

Phe Lys Glu Tyr Glu Thr Val Ser Gly Asp Trp Leu Leu Leu Leu Glu
145                 150                 155                 160

Thr Phe Ala Ile Phe Ile Phe Gly Ala Glu Phe Ala Leu Arg Ile Trp
                165                 170                 175

Ala Ala Gly Cys Cys Cys Arg Tyr Lys Gly Trp Arg Gly Arg Leu Lys
            180                 185                 190

Phe Ala Arg Lys Pro Leu Cys Met Leu Asp Ile Phe Val Leu Ile Ala
        195                 200                 205

Ser Val Pro Val Val Ala Val Gly Asn Gln Gly Asn Val Leu Ala Thr
    210                 215                 220

Ser Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Leu Arg Met
225                 230                 235                 240

Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Ala Ile Cys Ala
                245                 250                 255
```

```
His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu Thr Leu
            260                 265                 270

Ile Leu Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Val Pro Glu
        275                 280                 285

Val Asp Ala Gln Gly Glu Glu Met Lys Glu Glu Phe Glu Thr Tyr Ala
    290                 295                 300

Asp Ala Leu Trp Trp Gly Leu Ile Thr Leu Ala Thr Ile Gly Tyr Gly
305                 310                 315                 320

Asp Lys Thr Pro Lys Thr Trp Glu Gly Arg Leu Ile Ala Ala Thr Phe
                325                 330                 335

Ser Leu Ile Gly Val Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly
            340                 345                 350

Ser Gly Leu Ala Leu Lys Val Gln Glu Gln His Arg Gln Lys His Phe
        355                 360                 365

Glu Lys Arg Arg Lys Pro Ala Ala Glu Leu Ile Gln Ala Ala Trp Arg
    370                 375                 380

Tyr Tyr Ala Thr Asn Pro Asn Arg Ile Asp Leu Val Ala Thr Trp Arg
385                 390                 395                 400

Phe Tyr Glu Ser Val Val Ser Phe Pro Phe Phe Arg Lys Glu Gln Leu
                405                 410                 415

Glu Ala Ala Ser Ser Gln Lys Leu Gly Leu Leu Asp Arg Val Arg Leu
            420                 425                 430

Ser Asn Pro Arg Gly Ser Asn Thr Lys Gly Lys Leu Phe Thr Pro Leu
        435                 440                 445

Asn Val Asp Ala Ile Glu Glu Ser Pro Ser Lys Glu Pro Lys Pro Val
    450                 455                 460

Gly Leu Asn Asn Lys Glu Arg Phe Arg Thr Ala Phe Arg Met Lys Ala
465                 470                 475                 480

Tyr Ala Phe Trp Gln Ser Ser Glu Asp Ala Gly Thr Gly Asp Pro Met
                485                 490                 495

Ala Glu Asp Arg Gly Tyr Gly Asn Asp Phe Pro Ile Glu Asp Met Ile
            500                 505                 510

Pro Thr Leu Lys Ala Ala Ile Arg Ala Val Arg Ile Leu Gln Phe Arg
        515                 520                 525

Leu Tyr Lys Lys Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys
    530                 535                 540

Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Ser Arg
545                 550                 555                 560
```

```
Ile Lys Tyr Leu Gln Thr Arg Ile Asp Met Ile Phe Thr Pro Gly Pro
                565                 570                 575

Pro Ser Thr Pro Lys His Lys Lys Ser Gln Lys Gly Ser Ala Phe Thr
            580                 585                 590

Phe Pro Ser Gln Gln Ser Pro Arg Asn Glu Pro Tyr Val Ala Arg Pro
        595                 600                 605

Ser Thr Ser Glu Ile Glu Asp Gln Ser Met Met Gly Lys Phe Val Lys
    610                 615                 620

Val Glu Arg Gln Val Gln Asp Met Gly Lys Lys Leu Asp Phe Leu Val
625                 630                 635                 640

Asp Met His Met Gln His Met Glu Arg Leu Gln Val Gln Val Thr Glu
                645                 650                 655

Tyr Tyr Pro Thr Lys Gly Thr Ser Ser Pro Ala Glu Ala Glu Lys Lys
            660                 665                 670

Glu Asp Asn Arg Tyr Ser Asp Leu Lys Thr Ile Ile Cys Asn Tyr Ser
        675                 680                 685

Glu Thr Gly Pro Pro Glu Pro Pro Tyr Ser Phe His Gln Val Thr Ile
    690                 695                 700

Asp Lys Val Ser Pro Tyr Gly Phe Phe Ala His Asp Pro Val Asn Leu
705                 710                 715                 720

Pro Arg Gly Gly Pro Ser Ser Gly Lys Val Gln Ala Thr Pro Pro Ser
                725                 730                 735

Ser Ala Thr Thr Tyr Val Glu Arg Pro Thr Val Leu Pro Ile Leu Thr
            740                 745                 750

Leu Leu Asp Ser Arg Val Ser Cys His Ser Gln Ala Asp Leu Gln Gly
        755                 760                 765

Pro Tyr Ser Asp Arg Ile Ser Pro Arg Gln Arg Arg Ser Ile Thr Arg
    770                 775                 780

Asp Ser Asp Thr Pro Leu Ser Leu Met Ser Val Asn His Glu Glu Leu
785                 790                 795                 800

Glu Arg Ser Pro Ser Gly Phe Ser Ile Ser Gln Asp Arg Asp Asp Tyr
                805                 810                 815

Val Phe Gly Pro Asn Gly Gly Ser Ser Trp Met Arg Glu Lys Arg Tyr
            820                 825                 830

Leu Ala Glu Gly Glu Thr Asp Thr Asp Thr Asp Pro Phe Thr Pro Ser
        835                 840                 845

Gly Ser Met Pro Leu Ser Ser Thr Gly Asp Gly Ile Ser Asp Ser Val
    850                 855                 860
```

```
Trp Thr Pro Ser Asn Lys Pro Ile
865                 870

<210>  6
<211>  695
<212>  PRT
<213>  Homo sapiens

<400>  6
Met Ala Glu Ala Pro Pro Arg Arg Leu Gly Leu Gly Pro Pro Pro Gly
1               5                  10                  15

Asp Ala Pro Arg Ala Glu Leu Val Ala Leu Thr Ala Val Gln Ser Glu
            20                  25                  30

Gln Gly Glu Ala Gly Gly Gly Gly Ser Pro Arg Arg Leu Gly Leu Leu
        35                  40                  45

Gly Ser Pro Leu Pro Pro Gly Ala Pro Leu Pro Gly Pro Gly Ser Gly
    50                  55                  60

Ser Gly Ser Ala Cys Gly Gln Arg Ser Ser Ala Ala His Lys Arg Tyr
65                  70                  75                  80

Arg Arg Leu Gln Asn Trp Val Tyr Asn Val Leu Glu Arg Pro Arg Gly
                85                  90                  95

Trp Ala Phe Val Tyr His Val Phe Ile Phe Leu Leu Val Phe Ser Cys
            100                 105                 110

Leu Val Leu Ser Val Leu Ser Thr Ile Gln Glu His Gln Glu Leu Ala
        115                 120                 125

Asn Glu Cys Leu Leu Ile Leu Glu Phe Val Met Ile Val Val Phe Gly
    130                 135                 140

Leu Glu Tyr Ile Val Arg Val Trp Ser Ala Gly Cys Cys Cys Arg Tyr
145                 150                 155                 160

Arg Gly Trp Gln Gly Arg Phe Arg Phe Ala Arg Lys Pro Phe Cys Val
                165                 170                 175

Ile Asp Phe Ile Val Phe Val Ala Ser Val Ala Val Ile Ala Ala Gly
            180                 185                 190

Thr Gln Gly Asn Ile Phe Ala Thr Ser Ala Leu Arg Ser Met Arg Phe
        195                 200                 205

Leu Gln Ile Leu Arg Met Val Arg Met Asp Arg Arg Gly Gly Thr Trp
    210                 215                 220

Lys Leu Leu Gly Ser Val Val Tyr Ala His Ser Lys Glu Leu Ile Thr
225                 230                 235                 240

Ala Trp Tyr Ile Gly Phe Leu Val Leu Ile Phe Ala Ser Phe Leu Val
                245                 250                 255
```

```
Tyr Leu Ala Glu Lys Asp Ala Asn Ser Asp Phe Ser Ser Tyr Ala Asp
            260                 265                 270

Ser Leu Trp Trp Gly Thr Ile Thr Leu Thr Thr Ile Gly Tyr Gly Asp
        275                 280                 285

Lys Thr Pro His Thr Trp Leu Gly Arg Val Leu Ala Ala Gly Phe Ala
    290                 295                 300

Leu Leu Gly Ile Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser
305                 310                 315                 320

Gly Phe Ala Leu Lys Val Gln Glu Gln His Arg Gln Lys His Phe Glu
                325                 330                 335

Lys Arg Arg Met Pro Ala Ala Asn Leu Ile Gln Ala Ala Trp Arg Leu
            340                 345                 350

Tyr Ser Thr Asp Met Ser Arg Ala Tyr Leu Thr Ala Thr Trp Tyr Tyr
        355                 360                 365

Tyr Asp Ser Ile Leu Pro Ser Phe Arg Glu Leu Ala Leu Leu Phe Glu
    370                 375                 380

His Val Gln Arg Ala Arg Asn Gly Gly Leu Arg Pro Leu Glu Val Arg
385                 390                 395                 400

Arg Ala Pro Val Pro Asp Gly Ala Pro Ser Arg Tyr Pro Pro Val Ala
                405                 410                 415

Thr Cys His Arg Pro Gly Ser Thr Ser Phe Cys Pro Gly Glu Ser Ser
            420                 425                 430

Arg Met Gly Ile Lys Asp Arg Ile Arg Met Gly Ser Ser Gln Arg Arg
        435                 440                 445

Thr Gly Pro Ser Lys Gln Gln Leu Ala Pro Pro Thr Met Pro Thr Ser
    450                 455                 460

Pro Ser Ser Glu Gln Val Gly Glu Ala Thr Ser Pro Thr Lys Val Gln
465                 470                 475                 480

Lys Ser Trp Ser Phe Asn Asp Arg Thr Arg Phe Arg Ala Ser Leu Arg
                485                 490                 495

Leu Lys Pro Arg Thr Ser Ala Glu Asp Ala Pro Ser Glu Glu Val Ala
            500                 505                 510

Glu Glu Lys Ser Tyr Gln Cys Glu Leu Thr Val Asp Asp Ile Met Pro
        515                 520                 525

Ala Val Lys Thr Val Ile Arg Ser Ile Arg Ile Leu Lys Phe Leu Val
    530                 535                 540

Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys Asp
545                 550                 555                 560
```

```
Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Gly Arg Ile
                565                 570                 575

Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Val Gly Arg Gly Pro Gly
            580                 585                 590

Asp Arg Lys Ala Arg Glu Lys Gly Asp Lys Gly Pro Ser Asp Ala Glu
        595                 600                 605

Val Val Asp Glu Ile Ser Met Met Gly Arg Val Val Lys Val Glu Lys
    610                 615                 620

Gln Val Gln Ser Ile Glu His Lys Leu Asp Leu Leu Leu Gly Phe Tyr
625                 630                 635                 640

Ser Arg Cys Leu Arg Ser Gly Thr Ser Ala Ser Leu Gly Ala Val Gln
                645                 650                 655

Val Pro Leu Phe Asp Pro Asp Ile Thr Ser Asp Tyr His Ser Pro Val
            660                 665                 670

Asp His Glu Asp Ile Ser Val Ser Ala Gln Thr Leu Ser Ile Ser Arg
        675                 680                 685

Ser Val Ser Thr Asn Met Asp
    690                 695

<210>  7
<211>  854
<212>  PRT
<213>  Homo sapiens

<400>  7
Met Lys Asp Val Glu Ser Gly Arg Gly Arg Val Leu Leu Asn Ser Ala
1               5                   10                  15

Ala Ala Arg Gly Asp Gly Leu Leu Leu Leu Gly Thr Arg Ala Ala Thr
            20                  25                  30

Leu Gly Gly Gly Gly Gly Gly Leu Arg Glu Ser Arg Arg Gly Lys Gln
        35                  40                  45

Gly Ala Arg Met Ser Leu Leu Gly Lys Pro Leu Ser Tyr Thr Ser Ser
    50                  55                  60

Gln Ser Cys Arg Arg Asn Val Lys Tyr Arg Arg Val Gln Asn Tyr Leu
65                  70                  75                  80

Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His Ala
                85                  90                  95

Phe Val Phe Leu Leu Val Phe Gly Cys Leu Ile Leu Ser Val Phe Ser
            100                 105                 110

Thr Ile Pro Glu His Thr Lys Leu Ala Ser Ser Cys Leu Leu Ile Leu
        115                 120                 125
```

```
Glu Phe Val Met Ile Val Val Phe Gly Leu Glu Phe Ile Ile Arg Ile
    130                 135                 140

Trp Ser Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Gln Gly Arg Leu
145                 150                 155                 160

Arg Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Thr Ile Val Leu Ile
                165                 170                 175

Ala Ser Ile Ala Val Val Ser Ala Lys Thr Gln Gly Asn Ile Phe Ala
            180                 185                 190

Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Val
        195                 200                 205

Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val Val
    210                 215                 220

Tyr Ala His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu
225                 230                 235                 240

Val Leu Ile Phe Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Ala
                245                 250                 255

Asn Lys Glu Phe Ser Thr Tyr Ala Asp Ala Leu Trp Trp Gly Thr Ile
            260                 265                 270

Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Thr Pro Leu Thr Trp Leu
        275                 280                 285

Gly Arg Leu Leu Ser Ala Gly Phe Ala Leu Leu Gly Ile Ser Phe Phe
    290                 295                 300

Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val Gln
305                 310                 315                 320

Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala Ala
                325                 330                 335

Asn Leu Ile Gln Cys Val Trp Arg Ser Tyr Ala Ala Asp Glu Lys Ser
            340                 345                 350

Val Ser Ile Ala Thr Trp Lys Pro His Leu Lys Ala Leu His Thr Cys
        355                 360                 365

Ser Pro Thr Lys Lys Glu Gln Gly Glu Ala Ser Ser Ser Gln Lys Leu
    370                 375                 380

Ser Phe Lys Glu Arg Val Arg Met Ala Ser Pro Arg Gly Gln Ser Ile
385                 390                 395                 400

Lys Ser Arg Gln Ala Ser Val Gly Asp Arg Arg Ser Pro Ser Thr Asp
                405                 410                 415

Ile Thr Ala Glu Gly Ser Pro Thr Lys Val Gln Lys Ser Trp Ser Phe
            420                 425                 430
```

```
Asn Asp Arg Thr Arg Phe Arg Pro Ser Leu Arg Leu Lys Ser Ser Gln
        435                 440                 445

Pro Lys Pro Val Ile Asp Ala Asp Thr Ala Leu Gly Thr Asp Asp Val
    450                 455                 460

Tyr Asp Glu Lys Gly Cys Gln Cys Asp Val Ser Val Glu Asp Leu Thr
465                 470                 475                 480

Pro Pro Leu Lys Thr Val Ile Arg Ala Ile Arg Ile Met Lys Phe His
                485                 490                 495

Val Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys
            500                 505                 510

Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Cys Arg
        515                 520                 525

Ile Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Leu Gly Lys Gly Gln
    530                 535                 540

Ile Thr Ser Asp Lys Lys Ser Arg Glu Lys Ile Thr Ala Glu His Glu
545                 550                 555                 560

Thr Thr Asp Asp Leu Ser Met Leu Gly Arg Val Val Lys Val Glu Lys
                565                 570                 575

Gln Val Gln Ser Ile Glu Ser Lys Leu Asp Cys Leu Leu Asp Ile Tyr
            580                 585                 590

Gln Gln Val Leu Arg Lys Gly Ser Ala Ser Ala Leu Ala Leu Ala Ser
        595                 600                 605

Phe Gln Ile Pro Pro Phe Glu Cys Glu Gln Thr Ser Asp Tyr Gln Ser
    610                 615                 620

Pro Val Asp Ser Lys Asp Leu Ser Gly Ser Ala Gln Asn Ser Gly Cys
625                 630                 635                 640

Leu Ser Arg Ser Thr Ser Ala Asn Ile Ser Arg Gly Leu Gln Phe Ile
                645                 650                 655

Leu Thr Pro Asn Glu Phe Ser Ala Gln Thr Phe Tyr Ala Leu Ser Pro
            660                 665                 670

Thr Met His Ser Gln Ala Thr Gln Val Pro Ile Ser Gln Ser Asp Gly
        675                 680                 685

Ser Ala Val Ala Ala Thr Asn Thr Ile Ala Asn Gln Ile Asn Thr Ala
    690                 695                 700

Pro Lys Pro Ala Ala Pro Thr Thr Leu Gln Ile Pro Pro Pro Leu Pro
705                 710                 715                 720

Ala Ile Lys His Leu Pro Arg Pro Glu Thr Leu His Pro Asn Pro Ala
                725                 730                 735
```

```
Gly Leu Gln Glu Ser Ile Ser Asp Val Thr Thr Cys Leu Val Ala Ser
            740                 745                 750

Lys Glu Asn Val Gln Val Ala Gln Ser Asn Leu Thr Lys Asp Arg Ser
        755                 760                 765

Met Arg Lys Ser Phe Asp Met Gly Gly Glu Thr Leu Leu Ser Val Cys
    770                 775                 780

Pro Met Val Pro Lys Asp Leu Gly Lys Ser Leu Ser Val Gln Asn Leu
785                 790                 795                 800

Ile Arg Ser Thr Glu Glu Leu Asn Ile Gln Leu Ser Gly Ser Glu Ser
                805                 810                 815

Ser Gly Ser Arg Gly Ser Gln Asp Phe Tyr Pro Lys Trp Arg Glu Ser
            820                 825                 830

Lys Leu Phe Ile Thr Asp Glu Glu Val Gly Pro Glu Glu Thr Glu Thr
        835                 840                 845

Asp Thr Phe Ala Arg Ile
    850


<210>  8
<211>  29
<212>  PRT
<213>  Homo sapiens

<400>  8
Lys Lys Glu Gln Gly Glu Ala Ser Ser Asn Lys Phe Cys Ser Asn Lys
1               5                   10                  15

Gln Lys Leu Phe Arg Met Tyr Thr Ser Arg Lys Gln Ser
            20                  25


<210>  9
<211>  9
<212>  PRT
<213>  Homo sapiens

<400>  9
Lys Lys Glu Gln Gly Glu Ala Ser Ser
1               5


<210>  10
<211>  20
<212>  PRT
<213>  Homo sapiens

<400>  10
Asn Lys Phe Cys Ser Asn Lys Gln Lys Leu Phe Arg Met Tyr Thr Ser
1               5                   10                  15
```

Arg Lys Gln Ser
20